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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,747	02/08/2001	Michio Tanimoto	S-2482	6897

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SHERMAN & SHALLOWAY
413 North Washington Street
Alexandria, VA 22314

EXAMINER

OH, TAYLOR V

ART UNIT PAPER NUMBER

1625

DATE MAILED: 12/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/778,747

Applicant(s)

TANIMOTO, MICHIO

Examiner

Taylor Victor Oh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Final Rejection

The Status of Claims

Claims 1-4 have been rejected.

Claim Rejections-35 USC 102

1. Applicants' argument filed 10/1/2002 have been fully considered but they are not persuasive.

Rejection of Claims 1-4 under 35 U.S.C. 102(b) as being anticipated clearly by Wada et al (WO98/24746), which is equivalent to Wada et al (U.S. 6,028,220), has been changed to rejection of claims 1-4 under 35 U.S.C. 103(a) as being unpatentable over Wada et al (WO98/24746), which is equivalent to Wada et al (U.S. 6,028,220).

Claim Rejections-35 USC 103

The rejection of Claims 1-4 under 35 U.S.C. 103(a) as being unpatentable over Wada et al (WO98/24746), which is equivalent to Wada et al (U.S. 6,028,220), is maintained .

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al (WO98/24746) , which is equivalent to Wada et al (U.S. 6,028,220).

Wada et al discloses a process for the preparation of acrolein and acrylic acid by carrying out the vapor phase catalytic oxidation of propylene with molecular oxygen or a gas containing molecular oxygen using a fixed bed multi-tubular reactor (see col. 1 ,lines 8-13). Furthermore, the reaction process for the production of acrolein and acrylic acid can be performed by introducing a mixture gas consisting of 1 to 10 % by volume of propylene as the starting material (see col. 8 ,lines 26-29).

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In the process, a plurality of oxidation catalysts having a composition of the following formula is employed: $\text{Mo}_a\text{Bi}_b\text{Ni}_c\text{Co}_d\text{Fe}_f\text{Y}_g\text{Z}_h\text{O}_x$ where Mo, Bi, Ni, Co, and Fe represent molybdenum, bismuth, nickel, cobalt and iron, respectively; Y is at least one element selected from the group of tin, zinc, tungsten, manganese, magnesium, antimony and titanium; Z is at least one element selected from the group of potassium, rubidium, thallium, and cesium ; a, b, c, d, f, g, h, and x represent the number of atoms of molybdenum, bismuth, nickel, cobalt , iron, Y, Z, and oxygen; $a=12$, $b=0.1$ to 7 , $c+d=0.5$ to 20 , $f=0.5$ to 8 , $g=0$ to 2 , $h=0$ to 1 and x is determined by the oxidized condition of each element (see col. 4 ,lines 13-29) in U.S. 6,028,220.

Moreover, the plurality of catalysts having different occupying volumes (see col. 2 ,lines 45-47) is set-up so as to form a catalyst layer into two or three parts depending on calcination temperature and time and the plurality of catalysts with an amount of at least 20 % by weight based on the sum of the supported catalyst(see col. 4 ,lines 40-41) in each of a plurality of reaction zones is arranged in such an order that the activity increases toward the outlet from the inlet of the material in the axial direction of the tube (see col. 8 ,lines 47-54).

Furthermore, the Wada et al indicates that a plurality of catalysts having different occupying volumes are packed in such a manner that the occupying volume becomes smaller toward its outlet side from the inlet side of the reaction tube (see col. 2 , lines 45-49). In addition, the activities of a plurality of catalysts are controlled by changing composition of catalytically active components (kind and / or quantity of an alkali metal in particular) are packed in the reaction tube (see from col. 1 ,line 66 to col.

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2 , line 2). Also, the powder containing catalytically active components is subjected to preliminary calcinations at a temperature of from 300 to 500⁰ C. (see col. 5 ,lines 40-42).

However, the instant invention differs from the reference in that the amount of the alkali metal element and different occupying volumes for plural catalysts in the range are specified.

Concerning the unspecified amount of the alkali metal element and the unspecified, differently occupying volumes , the reference does describe in a different terminology that the plurality of catalysts having different occupying volumes (see col. 2 ,lines 45-47) is set-up so as to form a catalyst layer into two or three parts depending on calcination temperature and time and the plurality of catalysts with an amount of at least 20 % by weight based on the sum of the supported catalyst(see col. 4 ,lines 40-41) in each of a plurality of reaction zones is arranged in such an order that the activity increases toward the outlet from the inlet of the material in the axial direction of the tube (see col. 8 ,lines 47-54). In addition, the activities of a plurality of catalysts are controlled by changing composition of catalytically active components (kind and / or quantity of an alkali metal in particular) are packed in the reaction tube (see from col. 1 ,line 66 to col. 2 , line 2).

Furthermore, the limitation of a process with respect to the amount of the alkali metal element and occupying volumes does not impart patentability to a process when such values are those which would be determined by one of

ordinary skill in the art in achieving optimum operation of the process in the absence of an unexpected result. Occupying volume is well understood by those of ordinary skill in the art to be a result-effective variable, especially when attempting to control selectivity of a chemical process. Therefore, it would have been obvious to the skilled artisan in the art to have motivated to adjust the Wada's et al amount of the alkali metal element and occupying volumes by routine experimentations in order to obtain the optimum ranges for the catalytic activity for the plurality of catalysts. This is because the skilled artisan would expect to increase the catalytic activity for the plurality of catalysts by the manipulation of the amount of the alkali metal element and occupying volumes.

Response to Argument

2. The applicants argue the following issue:
 1. Wada et al fails to disclose plural catalysts different from each other in occupying volume, calcining temperature and type of alkali metal element;
 2. nothing is disclosed in the reference with respect to calcining temperature or type of alkali metal element.

The applicants' argument have been noted, but these arguments are not persuasive.

First, with regard to the calcining temperature and type of alkali metal element, and the occupying volume, the reference does indicate that the powder containing catalytically active components is subjected to preliminary calcinations at a temperature of from 300 to 500⁰ C. (see col. 5 ,lines 40-42); also, the activities of a plurality of catalysts are controlled by changing composition of catalytically active components (kind and / or quantity of an alkali metal in particular) are packed in the reaction tube (see from col. 1 ,line 66 to col. 2 , line 2). Furthermore, with respect to the occupying volume, this is well understood by those of ordinary skill in the art to be a result-effective variable, especially when attempting to control selectivity of a chemical process. Therefore, it would have been obvious to the skilled artisan in the art to have motivated to adjust the Wada's et al occupying volumes by routine experimentations in order to obtain the optimum ranges for the catalytic activity for the plurality of catalysts. This is because the skilled artisan would expect to increase the catalytic activity for the plurality of catalysts by the manipulation of the occupying volume. Therefore, the reference does teach those limitations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 703-305-0809. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alan Rotman can be reached on 703-308-4698. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-308-2742 for regular communications and 703-305-7401 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.

December 30, 2002